the particles of which are seldom visible. In small handmills of diorite this quartz appears to have been ground up and the gold extracted from it, but this appears to have been only profitable when done by convict labour. Prospectors in modern times, guided by the presence of these old workings, have attempted to carry on the extraction of the gold on a larger scale by modern methods, but only in a few cases has it been found that this can be done with profit, and most of the concessions have been surrendered.

The once-famous emerald-workings of Zabara and Sikait in this district are opened in masses of mica-schist, which alternate with gneiss, and contain crystals of tourmaline and beryl—the clear green varieties of this latter mineral constituting the valuable gem emerald. It would appear, however, that the ancients were satisfied with specimens which, owing to their clouded or flawed characters, do not appeal to the jewellers of the present day, and, extensive as the old workings undoubtedly were, there appears to be little chance of the industry being revived.

At several points on the Red-Sea coast, deposits of gypsum and anhydrite, with pockets of sulphur, occur, and concessions for the working of the latter mineral have been granted.

One successful mining industry, however, would appear to be in full operation in the little island of Tuberged, or St. John's, lying out in the Red Sea, forty or fifty miles from the coast. Here, in the midst of serpentine rocks, numerous beautiful crystals of peridot (oliome) are obtained, and the work of exploitation is being successfully carried on.

But although the expectations that this desert region might become a centre of a great mining industry do not seem likely of fulfilment, the district is not devoid of interest to the man of science. The rocks of the country exhibit, as shown by Dr. Ball, a very great variety and not a few remarkable characters, and the book before us, with its abundant photographic and other illustrations, is well worthy of the attention which it cannot fail to attract.

J. W. J.

THE PROBLEM OF A PURE MILK SUPPLY.

The Milk Question. By Prof. M. J. Rosenau. Pp. xiv+309. (London: Constable and Co.; Boston and New York: Houghton Mifflin Co., 1913.) Price 7*s.* 6*d.* net.

THE milk question is very much to the fore at the present time, and the appearance of this work is therefore opportune, and, although it embodies American views and practice, a great deal of it is applicable to our conditions. The author is well known as the present professor of hygiene at Harvard, and former director of the Hygienic Laboratory, Public Health and Marine Service, U.S.A., who has contributed much to the scientific investigation of milk and its bacteriology. From the sanitary point of view the book is sound, but, in addition, its author shows a knowledge of the subject from the producer's point of view, a side of the question which is frequently overlooked by sanitary reformers in this country. Written in simple language, it is a book for the educated public generally, and many striking cartoons and diagrams and terse sayings serve to drive home the views enunciated, *e.g.*—

> "It (milk) requires scrupulous care from pasture to pail, and from pail to palate."
>
> "The milk problem starts with the cradle, and ends with the grave. Sometimes it leads to an untimely grave."

One or two considerations may be quoted as illustrating the author's appreciation of the producer's point of view. As regards the question as to where the blame lies for an unhygienic milk supply, the author says the tendency is for the consumer to blame the producer, for the producer to blame the consumer, for the middleman to blame both of these, and for the health officer to blame all three. Really, society must blame itself; we are suffering the inevitable penalties we must pay for modern conditions of life, and of all those concerned the farmer is least to blame for the situation as it exists, and the consumer in the city should be ever mindful that he has largely brought the conditions upon himself.

While expressing the opinion that bottled milk is the ideal method of distribution, Prof. Rosenau fully recognises its dangers and difficulties—difficulties in the cleansing and handling of the bottles and in transportation, which, he points out, is expensive, bulky, the breakage is considerable, and the return freight adds to the cost. He looks forward to the time when milk will be dispensed in some form of cardboard non-returnable package.

On the mixing of milk from several cows, this the author says is desirable, as it furnishes a more uniform product, and tends to dilute infection if present; this the framers of Bills in this country might note.

On the cells present in milk, it is stated that normal milk has relatively few or no leucocytes, and, when critically examined, the majority of cells distinctly differs from leucocytes.

The author would ascribe from 5 to 7 per cent. of all human tuberculosis to infection with the bovine bacillus, but he is careful *not* to suggest that this is necessarily derived from milk, and quotes Weber's observations (made for the

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German Imperial Board of Health), which seem to show that the risk of infection from tuberculous milk is surprisingly small.

Clean milk, and methods of producing and controlling it, are dealt with at some length, and some interesting details are given respecting certified milk.

A long chapter is devoted to pasteurisation of milk, and this process is strongly advocated, under proper safeguards, such as labelling with the time, temperature, and date of pasteurising, as a general method for treating the milk supply if a pure milk cannot otherwise be guaranteed.

Singularly little is said respecting infants' milk depôts. In view of the comparison made by some between the United States and this country in this respect, we should have expected more information had this method of dealing with infant mortality the importance which some would ascribe to it. Altogether the book is a valuable one, and one to read, ponder, and digest.

R. T. Hewlett.

OUR BOOKSHELF.

Theoretische Astronomie. By Dr. W. Klinkerfues. Neubearbeitung von Dr. H. Buchholz. Dritte verbesserte und vermehrte Ausgabe. Pp. xxxviii + 1070. (Braunschweig: F. Vieweg und Sohn, 1912.) Price 50 marks.

The claims of Klinkerfues and Buchholz are readily admitted by all acquainted with the calculation of orbits. The classical treatises of Oppolzer and Watson having run out of print, it was most fortunate that this, the practical, side of gravitational astronomy was taken up by Buchholz, who extended the original work of Klinkerfues to make it fit to take the place of the former works. The plan of dividing the subject-matter into lectures (*Vorlesungen*) is still continued, although much is unsuitable for verbal exposition. Lecture 14, for example, extends to ninety pages, and gives, besides the general theory of the earth's rotation, all the formulæ necessary for the reduction of observations.

The greater part of this edition agrees exactly with the last, but the additions are well worthy of attention. The new preface runs to twenty pages, and gives a historical treatment of recent advances in the theory of orbits. Although Gyldén's work in no way enters into the subject treated in the work, Buchholz has described at some length the claims of the great Swedish astronomer. We believe that posterity will give to Gyldén the place which is due to one who did much for the cause of dynamical astronomy as applied to real, in contrast with merely ideal, problems. The criticisms of Bauschinger and others have led to Harzer's method not being developed, but the vector method of Willard Gibbs is retained. We are glad to see that Leuschner's method has been introduced. The method is carefully explained, the formulæ are collected, and a considerable number of examples are worked out. The necessary new table is given, and Oppolzer's M- and N-tables have been reproduced.

An appendix gives the known errors in the works of Bauschinger and Oppolzer on the determination of orbits.

The greatest fault of the book is its bulk. For a work intended to assist in the numerical calculation of orbits it is almost essential that the auxiliary tables should be easily manipulated. This work could with advantage be divided into several volumes.

J. Jackson.

New Contour Map of the Near and Middle East (The Land of the Five Seas). (London: G. W. Bacon and Co., Ltd.) Price 7*s.* 6*d.*

This wall-map includes the empires of Babylon, Persia, Parthia, Egypt, and Rome. It shows the routes of Alexander the Great, Pompey, and St. Paul, and illustrates classical history from the earliest times. The scheme of ten colours makes it possible to show with impressive clearness the close relation between land configuration and the spread of civilisation. The scale of the map is ninety-five miles to an inch. In the bottom left corner an inset orographical map of Palestine is provided. The size of the map as a whole—40 by 30 in.—will indicate that it is scarcely large enough for use in big classes, but it should prove of service to individual students in the higher forms of secondary schools.

The Tarn and the Lake. Thoughts on Life in the Italian Renaissance. By C. J. Holmes. Pp. xi + 48. (London: Philip Lee Warner, 1913.) Price 2*s.* 6*d.* net.

This essay of Mr. Holmes forms very pleasant reading; originally designed as an introduction to a few studies of Italian painting and sculpture, it overran its intended bounds and became eventually the present little volume. Entertaining analogies are drawn between certain communities of fish and certain societies of men, and though the appeal is more directly to anglers, all readers who appreciate literary expression will enjoy the essay.

LETTERS TO THE EDITOR.

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Pianoforte Touch.

The question as to whether what is known as touch is due to any peculiarity, apart from the energy, with which the hammer strikes the strings, and, consequently, with which the fingers strike the keys, would appear to be determinable by direct experiment. Personally I have always held, probably with the majority of people, that touch is dependent on such peculiarities, but the evidence seems to be decidedly against it. A note was struck one hundred times in succession so as to produce sound of as nearly as possible the same intensity; on half these occasions it was struck in a pressing, or caressing, manner; in the other cases it was struck sharply; the different

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